

Acute Gallbladder Disease

Experiences with 103 Consecutive Cases

PHILLIPS JOHNSON, M.D., and MYRON B. CLOSE, M.D., San Francisco

THE MOST FREQUENT INDICATION for abdominal operation after the age of sixty is disease of the biliary tract. The acute form of the disease in this older age group is associated with a distressingly high mortality rate. The gradual increase in the average age of our population has brought this problem more acutely into focus in the recent years. In the younger age groups the disease is predominantly one of females, but as aging progresses the proportion of males increases until at about 65 cholecystitis occurs with equal frequency in both sexes. Crump³ observed that the incidence of stones also increases with age; half of all persons at the age of 70 have cholelithiasis. Among physicians dealing with this problem the conviction is growing that at the first signs of trouble a cholecystectomy should be performed before age and the inevitable progression of the disease lead to an operation of necessity on an infirm and debilitated patient. The mortality rate for elective operation before the age of 60 is less than 1 per cent; for the acute form of the disease after the age of 65 it is more than 10 per cent.

A great deal has been written relative to the proper time for surgical intervention in the acute form of the disease. Yet statistically there is little difference in mortality rate as between immediate and delayed operation. Advocates of immediate operation believe that the danger of rupture of the gallbladder or the chance of spreading infection outweighs the risk of operating on a seriously ill patient. Observers who believe delay of operation is better feel that there is less risk of damage to vital structures and of complications when operation is performed after the subsidence of the acute phase of the disease without the complicating factors of obscuring edema and inflammatory exudate. Almost all investigators agree that operation should be done if a patient does not improve under conservative management. Most observers stress that the time of operative intervention should be governed by factors in the individual case and none advocates that operation is so urgent that balancing electrolytes can be neglected. A wise surgeon's choice is also influenced by competence of the available assistance and anesthesia.

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• One hundred and three cases of acute cholecystitis in patients ranging in age from 19 to 88 years were reviewed. Operation was done in all cases. Seventy per cent of the patients were women.

Primary cholecystectomy was done in 72.8 per cent of the series. Primary cholecystostomy was performed in the remainder, and one-fourth of these patients had a secondary cholecystectomy. No specific time, with relation to interval after onset of symptoms, was chosen for operation.

Jaundice was present in 14.5 per cent of patients at the time of admittance to hospital. Serum amylase was above normal in five of 27 patients on whom this determination was carried out. All five were women.

The gallbladder was perforated in 13 cases. Common duct exploration was done in 25 cases and in 12 of them stones were found.

The morbidity rate for the series was 11.6 per cent; the mortality rate 9.7 per cent.

The 103 patients with acute cholecystitis whose cases are here presented for analysis entered the Stanford University Service of the San Francisco Hospital in the ten years 1945-1955 with acute abdominal pain and were observed because of diagnostic problems. Many of the patients had had previous attacks and might be considered as having an acute episode in the course of chronic cholecystitis. There were 85 white and 18 nonwhite patients, a race distribution approximately proportionate to the race distribution of all patients admitted to the hospital. The age range was from 19 to 88 years, with roughly one half of the patients less than 60 years of age. Seventy per cent of the total were women. There was one man and 22 women under 40 years of age. After the age of 40 the ratio was approximately two women to one man. Of the 73 women, 29 had had no pregnancies. Age and sex data by decades was as follows:

Age (Years)	Female	Male
0 to 20.....	1	0
20 to 29.....	16	0
30 to 39.....	5	1
40 to 49.....	12	5
50 to 59.....	7	8
60 to 69.....	15	5
70 to 79.....	11	8
80 to 89.....	6	3

CHOLECYSTOSTOMY AND CHOLECYSTECTOMY

Seventy-five of the patients had primary cholecystectomy. Twenty-eight had primary cholecystostomy and seven of the 28 had cholecystectomy. The remaining 21 were not subjected to a cholecystectomy because of the following reasons: Eight died post-operatively, five were lost to follow-up and three were treated without operation because of lack of symptoms. In five it was felt unwise to operate because of advanced age and/or other associated disease.

Interval Between Onset and Operation

In general our policy is to operate when the acute phase is subsiding. After gastric suction and antibiotic therapy are begun, an effort is made to correct electrolyte imbalance. Surgical intervention is undertaken promptly if the patient's condition deteriorates or does not improve under conservative management. If improvement continues, we operate when the symptoms have subsided. In certain cases in which the patient's condition was deemed excellent, cholecystectomy was done in the acute phase without further observation. We have not hesitated to operate in the face of the increased bacteriological growth in the gallbladder reported to occur from the fourth to tenth day after the onset of cholecystitis. We have found inflammatory edema which often persists for two to three weeks or longer not to be a serious obstacle. In a few patients it was noted that cholecystectomy would have been technically easier in the absence of inflammatory reaction, but the operation was completed without incident in each of these cases. In one patient who was operated on in the second week after the onset of acute cholecystitis, laceration of the common duct occurred and was noticed and repaired. No patient in the series returned with common duct stricture.

The time between onset of symptoms and operation was as follows:

Days of Symptoms	Number of Cholecystectomies	Number of Cholecystostomies	Total Operations
1	5	3	8
2	6	3	9
3 to 4.....	5	11	16
5 to 7.....	12	5	17
8 to 14.....	18	3	21
15 to 21.....	17	3	20
22 to 42.....	5	0	5
Over 42	7	0	7
Total	75	28	103

Eighty (78 per cent) of the patients were observed at operation to have stones in the gallbladder.

Fifteen patients were jaundiced on admission. Choledochotomy was performed in each instance. In one case, owing to the critical condition of the

patient, drainage of the common duct was carried out without exploration of the duct. In ten of the remaining 14 cases stones were observed in the common duct at operation. In one patient jaundice developed a month following cholecystectomy which had been preceded by cholecystostomy. Upon reoperation a stone was recovered from the common duct.

Serum Amylase

Twenty-seven patients had serum amylase determinations. In our laboratory, over 200 units per 100 cc. is considered abnormal. Five of the 27, all women, had amylase content above that level. Brief descriptions of the cases follow:

1. Age 24 years; amylase 280 units; history of jaundice; dilated cystic duct; two small stones recovered from the common duct; pancreas normal.
2. Age 45 years; amylase 410 units; jaundiced; common duct and cystic duct slightly dilated; stones in gallbladder; no stones found in common duct; pancreas normal.
3. Age 23 years; amylase 790 units; jaundiced; numerous small stones in common duct; pancreas normal.
4. Age 69 years; amylase 1,100 units; jaundiced; no stones found in common duct; pancreas normal.
5. Age 26 years; amylase 1,810 units; jaundiced; gallbladder contained many stones; no stones found on exploration of slightly dilated common duct; pancreas normal.

It is interesting that in these five cases in which pancreatitis was suggested by an elevated serum amylase the pancreas appeared normal at the time of operation.

Perforations

Perforation of the gallbladder was noted in 13 cases. In three cases the perforation was into the free abdominal cavity, and profuse hemorrhage occurred in one of these three. In ten cases the area of perforation was walled off and peritonitis was localized. The walled off perforation was into the liver bed in two cases and in a third it was associated with a primary carcinoma of the gallbladder, the only carcinoma in the series. There were three deaths in the group in which perforation had taken place.

Exploration of the Common Duct

Twenty-five, or roughly one-fourth, of the patients were subjected to exploration of the common duct, and stones were found there in 12 cases. The indications for exploration and the incidence of them in the 25 cases were as follows: Jaundice or history of jaundice in 17 cases; dilated common duct, 12 cases; small stones in gallbladder, 10 cases; abnor-

TABLE 1.—Data on Ten Cases in Which Patient Died

Age	No. of Patients	Operation	Cause and Time of Death	Days from Onset of Symptoms to Operation
40-49	1	Cholecystostomy.....	Aspiration and death at operation.....	2
60-69	1	Cholecystectomy.....	Anuria; second postoperative day.....	7
70-79	3	Cholecystostomy.....	Peritonitis; first day.....	3
		Cholecystostomy.....	Coronary occlusion; second postoperative day.....	2
		Cholecystectomy.....	Pneumonia; fourth postoperative day.....	3
		Cholecystostomy.....	Coronary occlusion; fourteenth postoperative day.....	3
80-89	5	Cholecystostomy.....	Pulmonary embolism.....	1
		Cholecystostomy.....	Inanition; two months postoperatively.....	21
		Cholecystostomy.....	Pneumonia; fourth postoperative day.....	3
		Cholecystostomy.....	Cerebrovascular accident; sixth postoperative day.....	10

malities to palpation, 8 cases; pancreatitis (as indicated by elevated serum amylase), 5 cases.

X-ray Studies

Scout films of the abdomen were taken in 39 cases. In 27 of them no abnormalities were observed, in 12 radiopaque stones were visualized, and two showed a mass in the region of the gallbladder. Oral cholecystograms were done in 33 cases after subsidence of symptoms. Twenty-eight showed nonfunction of the gallbladder. At operation 22 of the patients in the nonfunctioning group had stones and six did not. Three of the total group showed poor function with radiolucent stones and two had normal function with nonopaque stones. Cholangiograms were done in six cases following cholecystostomy, and in three of them stones were demonstrated. T-tube or catheter drainage was provided in all but one of the cases in which common duct exploration was done. Cholangiograms were done by introducing the dye through the tubes usually on about the tenth to fourteenth postoperative day. If no obstruction was demonstrated, the tube was clamped for a day or two and then removed. Operative cholangiograms were not made in any case.

Morbidity

Postoperative complications occurred in 12 cases. There seemed to be no relationship between the time interval from the onset of symptoms and operation to the number or gravity of complications. Complications that occurred in two cases each were wound dehiscence, subphrenic abscess and superficial wound infection, and complications in one case each were abdominal abscess, postoperative fever of undetermined cause, thrombophlebitis, cholangitis and pancreatitis, laceration of common duct (immediately repaired) and shock, the operation having been stopped in this case and completed four days later.

Mortality

There were ten deaths, eight of which occurred following cholecystostomy in seriously ill patients. Only two of the patients who died were less than

70 years of age. Data on the cases in which death occurred are given in Table 1.

DISCUSSION

In spite of the fact that there is little difference in mortality and morbidity shown between early and late intervention, we believe that if treatment is determined on the basis of circumstances in each case, an improvement in results can be obtained. Our series does not show significant difference from other series with regard to morbidity and mortality, and it occurs to us that perhaps if the proponents of immediate operation and those who advocate postponement were to state their exceptions, it would turn out that their policies were tantamount to ours. In this day of antibiotics, whether to operate early or late must be dictated by the surgeon's ability to judge the changing clinical signs and symptoms. No surgeon wishes to operate on a seriously ill patient if he feels that the chances are that with delay he can approach the same problem under greatly improved conditions. On the other hand, no surgeon would deny a moribund patient a chance to live.

We have not found that the fourth to the tenth day is a critically unfavorable period for surgical intervention, nor do we feel that it is necessary to continue conservative treatment for two to three weeks if acute signs and symptoms have receded.

Seven of the patients who died were operated on within three days of the onset of the attack, and all with the exception of one had cholecystostomy because of the gravity of their condition. Two additional deaths occurred following cholecystostomy ten days and three weeks after onset of symptoms. In those cases operation was done because of progression of symptoms. One-third of the patients in the present series were operated upon between the fourth and fourteenth day. Of these only one, a woman in her sixties, died. The cause of death was anuria.

Exploration of the common duct was undertaken in approximately 25 per cent of the patients, which

is about the same proportion as reported in most other series. Recently there has been a tendency to explore the duct in more cases. Stones were found in 46 per cent of the cases in which exploration was done. Ten of the 12 patients with common duct stones had jaundice. In four patients with jaundice no stones were found on exploration of the common duct.

It is interesting that all five patients with elevated amylase were women and at the time of operation no evidence of pancreatitis was found. It is known, of course, that there are conditions other than pancreatitis that will cause an increase in serum amylase.

We feel that more critical thought should be given to the proposition that asymptomatic cholelithiasis is an indication for operation without reference to age. Crump³ observed that in 1,000 autopsies cholelithiasis was present in 25 per cent of subjects more than 40 years of age and in 50 per cent of those past 70 years. There are 11,250,000 people in this country over 65 years of age. Applying Crump's autopsy data would indicate the incidence of stones in this age group around 35 per cent. Assuming that over 10 per cent of these have already had cholecystectomy (which is certainly a high figure), there would then be in this age group 3,500,000 persons for whom cholecystectomy would be indicated. If the operative mortality were 3 per cent, as Glenn and Hays⁷ reported it to be in patients over 65 years of age having cholecystectomy, there would be 105,000 operative deaths, not to mention morbidity. United States government statistics show 3.4 per cent of deaths in this age group are from gallbladder disease. Certainly a goodly number of those who died must have had symptoms before their final illness. It would seem that some consideration of the severity

of symptoms should be required, as well as general assessment of the patient's condition, as prerequisites to any recommendation of a general operative program for removal of stones in all age groups; but because of the seriousness and frequency of cholecystopathy in aged persons, we feel that prophylactic removal of asymptomatic stones is indicated in the younger age groups in which surgical mortality associated with the operation is very low.

655 Sutter Street, San Francisco 8 (Johnson).

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